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ABSTRACT

A study examined the achievement scores of second graders by race and sex on several measures of language competence. Achievement was measured in paradigmatic language, reading comprehension, sight vocabulary and listening comprehension. Subjects were 157 second graders in a large elementary school in a rural county in Georgia; one-third of the subjects were black. The mean income of families living in the area was substantially lower than that of the national average. Results showed that girls' scores were superior to those of boys (.05) on all measures. Scores of whites were superior (.01) to those of blacks. While scores of white girls were higher than those of white boys (.05) on all measures except that of paradigmatic language, scores of black boys and black girls were almost identical on all measures. Research suggests that cultural differences could account for varying levels of motivation. Also, the white boys involved in this study lived in an environment in which emphasis was not placed on academically oriented activities for boys. The proposal that cultural influences account for the superior performance of the white girls appears plausible. (Four tables of data are included, a list of suggested areas of further research and 25 references are attached.) (RAE)

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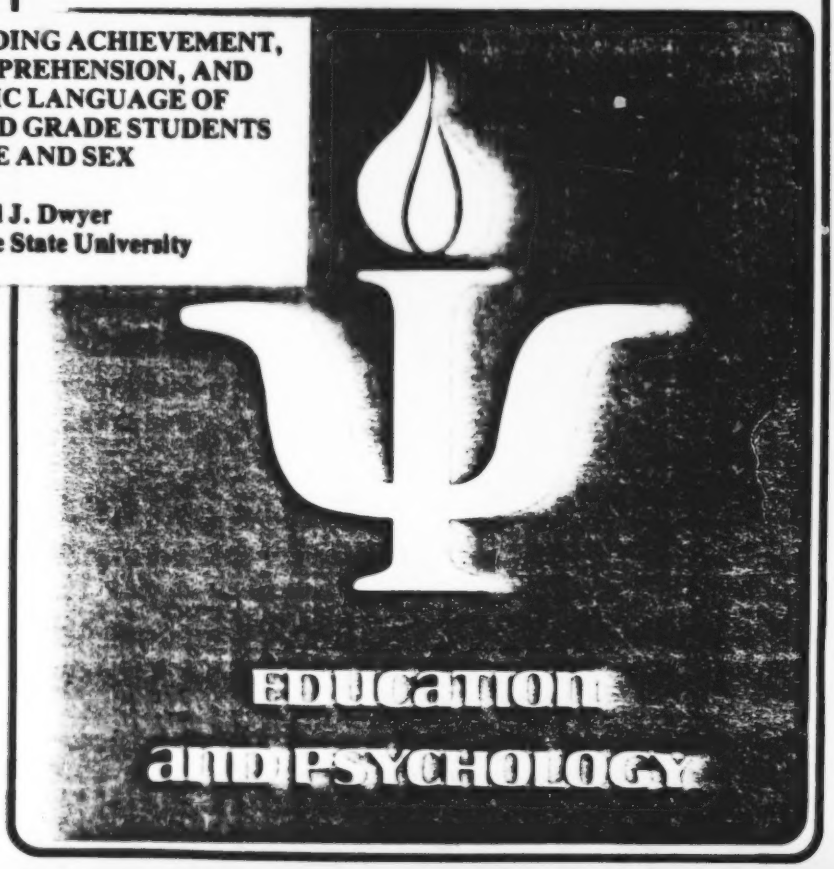

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ABSTRACT

Achievement scores of second grade subjects were examined by race and sex on several measures of language competence. Achievement was measured in paradigmatic language, reading comprehension, sight vocabulary and listening comprehension.

Correlations yielded significant (.05) results between all measures. Multiple regression analysis was computed with reading comprehension as the criterion variable. The measures of sight vocabulary ($r = .76$) and listening comprehension ($r = .47$) added significantly to the predictive value of the criterion variable.

Girls' scores were superior to those of boys (.05) on all measures. Scores of whites were superior (.01) to those of blacks. While scores of white girls were higher than those of white boys (.05) on all measures except that of paradigmatic language, scores of black boys and black girls were almost identical on all measures.

Researchers have been seeking for many years to determine the relationship between environmental stimuli and language development. Since it is largely through language development that human beings attempt to gain in understanding and controlling environmental stimuli, the study of language development appears to be an area of extreme

importance. Further, the intellectual property which enables people to use language endows human beings with the ability to create and express thoughts in a realm which is infinite in possibilities and is a realm which is not bound to a particular stimuli (Chomsky, 1966). In other words, through successful acquisition of language, people tend to correspondingly grow in capacity to either reject, modify, or accept stimuli which are apparent to the senses. A person deals with the enormous amount of stimuli and makes sense out of it through development of the capacity to form verbal concepts. Concept formation is the capability to classify stimuli into components which can be recognized as belonging within particular categories. Language is the vehicle through which environmental stimuli are ordered and concepts are formed. Consequently, an individual's success in dealing with his or her environment depends in a large measure on the ability to use language. As Pauk (1974) suggested, "without an adequate vocabulary, mastery of important principles and ideas is not possible" (P. 82).

Over the past several decades, one of the most widely scrutinized areas of language development has been reading achievement (Pelosi, 1977). While educators have rightly placed considerable emphasis on reading research, in more recent years the area of paradigmatic language evaluation has become a subject for more intense study (Dinnan, 1970-1971; McNeil, 1966). Further concerning academic learning, capabilities relative to listening comprehension are obviously of great importance to learners.

In this study, an examination of the language capabilities of a selected group of second graders was undertaken with performance evaluated relative to 1) reading achievement (comprehension, and sight vocabulary), 2) listening comprehension, and 3) paradigmatic language. Because assessment of competence in paradigmatic language is a comparatively new measure of language proficiency, the following section will review literature in this area.

Paradigmatic Language

Language is an agreed upon verbal set of descriptors of

stimuli common to a particular group of people. Language is understood because word meanings are contrasted with other word meanings. For example, the word "hot" is understood because of awareness of such concepts as cold, tepid, scalding, etc. The inherent use of contrast in language provides the user with a base reference system of language as opposed to a personal reference system. A personal reference to the stimulus "hot," for example, might be "cocoa" or "coffee." The ability to use language as a base reference system as opposed to a personal reference system is the genesis of paradigmatic language competence.

Paradigmatic language is usually measured by evaluation of an individual's responses to a series of stimulus words. Such measurement is an outgrowth of the stimulus-response tests long used by psychologists (Esper, 1973). Responses to stimulus words are judged to be either paradigmatic or non-paradigmatic relative to the stimulus word. A paradigmatic response contrasts with the stimulus word, while being either superordinate or coordinate to the stimulus word. A superordinate response is a word which is part of a system which includes the stimulus word: for example, the response "human" to the stimulus "boy." A coordinate response is a response which is determined to be part of the classification system of a particular word: for example, the response "huge" to the stimulus "big."

Entwisle (1966) examined paradigmatic language development among more than 500 primary grade students. She reported that when adjective stimulus words were used, paradigmatic responses were more frequent in young children than when verb stimulus words were used. Further, this researcher concluded that for most children there is a definite shift from non-paradigmatic responses to paradigmatic responses which is most pronounced between the ages of six and eight. She reported that differences between the sexes were "small" while, on the other hand, the influence of IQ appeared to be an important variable. Entwisle found that children who produced more paradigmatic responses generally scored higher on IQ tests. Further, children living in lower socioeconomic conditions tended to

produce fewer paradigmatic responses. Entwisle concluded that word association data provides evidence as to a subject's understanding of which combinations of words can be used to generate meaningful interaction. Further, and perhaps most importantly, Entwisle's data led her to the conclusion that word association data could be used to determine how a child processes "acoustic signals" in trying to comprehend language. Additional data which supports Entwisle's findings were reported in later studies by Bickley, Dinnan, and Beckley (1970) and McNinch, Richmond, and Hornsby (1970).

Relative to reading achievement, Shen and McNinch (1971) examined the relationship between students' performance on the reading subtests of the *Iowa Tests of Basic Skills* and their performance on a measure of paradigmatic language. From a sample of nearly 300 junior high school students, the researchers identified 25 good and 25 poor readers to whom they administered the measure of paradigmatic language. They found that the good readers performed in a significantly superior manner on the measure of paradigmatic language. Further, when the overall sample was evaluated by race it was found that scores obtained by whites were significantly superior to those of blacks on both the measure of reading achievement and the measure of paradigmatic language. The researchers determined, however, that "a definite difference by race cannot be concluded." No significant sex differences were found by Shen and McNinch. An intensive and broad review of studies relative to learning to read among various ethnic and social subgroups within the general population is provided by Seitz (1977).

Researchers have consistently reported results which suggest that paradigmatic language competence is an important asset relative to academic achievement. In addition to those cited above, studies by Lamarre (1976) and Cartelli (1976) support this contention.

SUBJECTS

The sample included 157 second graders in a large elementary school in a rural county in Georgia. Approximately one-third of the subjects were black. The mean income of families residing in the area serviced by the school was substantially lower than that of the national average (Bureau of Commerce, 1974). School personnel suggested that no more than one percent of the elementary school students within the area attended private schools.

PROCEDURES

Hypotheses were designed to examine the relationships among several measures of language: 1) the *Oral P/S Language Inventory* (Dinnan, 1971) as a measure of paradigmatic language (Appendix A), 2) the reading subtests of the *Metropolitan Achievement Tests* (1971), 3) the *Slosson Oral Reading Test* (1963) (SORT) to measure sight vocabular, and 4) the *Diagnostic Reading Scales* (Spache, 1972) to measure listening comprehension. Pearson product-moment correlations were computed between all the measures used. Data were further examined using multiple step-wise analysis with reading achievement as the criterion variable. Scores of subjects by race and sex were examined through analysis of variance.

RESULTS

Correlations ranged from .44 to .76 inclusive demonstrating significant relationships ($\rho < .05$) between all the measures. The most substantial correlation was found between the Metropolitan and the SORT, both of which are measures of reading achievement. Correlational data are presented in Table 1.

Multiple step-wise regression analysis yielded significant F values ($\rho < .05$) for sight vocabulary and listening comprehension with the Metropolitan used as the criterion variable. Inclusion of the measure of paradigmatic language did not add to the predictive power of the other two measures. Data are represented in Table 2.

TABLE 1
Correlations Between the Metropolitan Achievement Tests, the Spache Test, P/S Test, and the SORT

	P/S	SORT	Spache
Metropolitan	.44*	.76*	.47*
P/S		.51*	.44*
SORT			.49*

*Significant at the .05 level.

TABLE 2
Summary of Step-wise Regression Analysis with SORT, Spache, and P/S Inventory as Predictors of Mean Scores on the Metropolitan Test

Step	Predicator Variable	Multiple R	R^2	F
1	SORT	.7578	.5743	110.285*
2	Spache	.7661	.5869	3.538*
3	P/S Inventory	.7671	.5885	.589

*Significant at the .05 level.

Scores were obtained for subgroups designated by race and sex. On all measures, white girls produced the highest mean scores. The Metropolitan, SORT, and Spache measures yielded grade equivalent scores while percent of correct responses determined scores on the paradigmatic language test. Data are presented in Table 3.

F probabilities were determined through analysis of variance. Data are presented in Table 4.

DISCUSSION

Girls' scores were superior to those of boys in reading comprehension (.05), sight vocabulary (.01), and paradigmatic language (.05) while mean scores between the sexes were almost identical in listening comprehension. Reading comprehension and sight vocabulary are closely related to school oriented activities while listening vocabulary tends to develop more from overall en-

TABLE 3
Means and Standard Deviations by Sex and Race

Variable		Boys (Black)[a]	Girls (Black)[b]	Boys (White)[c]	Girls (White)[d]	Total Boys	Total Girls	Total Black	Total White
Metropolitan	X	2.01	2.07	2.65	3.21	2.37	2.72	2.04	2.92
(Reading)	SD	.74	.65	1.32	1.06	1.14	1.07	.70	1.22
SORT	X	1.60	1.78	2.95	4.06	1.68	1.88	1.11	1.86
(Sight Vocab.)	SD	1.16	1.05	1.79	1.76	1.68	1.88	1.11	1.86
Spache	X	3.11	3.08	3.81	3.83	3.50	3.51	3.10	3.82
(List. Comp.)	SD	.67	.79	1.05	1.15	.96	1.07	.73	1.10
P/S	X	32.89	41.78	55.51	66.48	45.46	55.80	37.07	60.80
(Paradig. Lang.)	SD	33.35	32.84	28.62	28.90	32.64	32.85	33.17	29.11

[a] n = 36; [b] n = 32; [c] n = 45; [d] n = 42

TABLE 4
Summary of Analyses of Variance Examining Sex and Race Differences

Source	Metropolitan (Reading) MS	F	SORT (Sight Vocab.) MS	F	Spache (List. Comp.) MS	F	P/S (Paradig. Lang.) MS	F
Boys vs Girls (Total)[a]	483.17	3.97[f]	2017.83	6.43[f]	0.29	0.00	4134.95	3.86
Within Groups	122.41		313.77		103.75		1071.60	
Black vs White (Total)[a]	2962.31	27.89[h]	12363.10	50.23[h]	2017.74	22.28[h]	21494.71	22.43[h]
Within Groups	106.21		246.15		90.56		958.14	
Boys vs Girls (White)[b]	2611.81	3.19	2657.57	8.43[g]	1.56	0.01	2611.81	3.16
Within Groups	826.80		315.41		121.53		826.80	
Boys vs Girls (Black)[c]	5.11	0.10	55.66	0.45			1339.63	1.22
Within Groups	49.23		123.32		53.36		1099.47	
Black vs White (Boys)[d]	800.82	6.61[f]	3651.02	15.34[h]	972.19	11.87[h]	10235.25	10.78[g]
Within Groups	121.13		238.07		81.91		949.13	
Black vs White (Girls)[e]	2383.35[e]	28.72[h]	9407.44	41.96[h]	1048.94	10.23[g]	11076.00	11.79[h]

[a] df = 1; 153, [b] df = 1; 85, [c] df = 1; 66, [d] df = 1; 79, [e] df = 1; 72, [f] $p < .05$, [g] $p < .005$, [h] $p < .001$

vironmental experiences rather than those relative to formal school instruction. It must be assumed that paradigmatic language development occurs primarily as a result of broadly based environmental factors since its encouragement in children is seldom, if ever, consciously aproached as an instructional aim in elementary schools. The superior paradigmatic language scores of the girls suggests that the girls demonstrated a more intrinsic awareness than the boys concerning how words are used in communication. Further, it appears probable that factors which encouraged paradigmatic language in the girls also tended to encourage achievement in reading and listening comprehension.

Data relative to sex differences tends to be consistent with research which indicates that American elementary school girls usually read better than their male counterparts. This conclusion has been reached by numerous researchers but most convincingly in two comprehensive studies undertaken through the National Assessment of Educational Progress (1974, 1976).

As mentioned above, white girls performed in a manner which was significantly superior to the performance of white boys on three of the four measures of language. On the other hand, when scores of black boys and black girls were compared, there were no significant differences. In fact, on the measures of sight vocabulary, reading comprehension, and listening comprehension, the mean scores of black boys and black girls were nearly identical. The measure of paradigmatic language produced slightly higher, though not significantly higher, scores for the black girls.

What factors, cultural or physiological, contributed to differences in scores between white boys and white girls? Some research suggests cultural differences could account for varying levels of motivation. Preston (1962) examined reading achievement of American boys and girls and found significant differences favoring females. He then compared German boys and girls with comparable material. He concluded that cultural expectations were primarily responsible for the lowered reading achievement of American boys while German boys read as well as German

girls because reading in Germany was considered to be part of the normal activity of the male. In a later study, Preston (1979) sought to determine if the lack of sex differences also occurred in Germany because a substantial number of boys received primary grade reading instruction from male instructors. Preston concluded that boys with male teachers achieved in reading at no higher level than those with female teachers. Preston's conclusion is widely supported in the literature (Lahaderne, 1976; Duncan, 1976).

The contention appears valid that the white boys involved in this study lived in an environment in which it could be expected that among girls more emphasis was placed on academically oriented activities. The proposal that cultural influences account for the superior performance of the white girls appears plausible. On the other hand, a comprehensive review of literature led Gundersen (1976) to conclude that although sex differences do exist the research has provided "little insight" as to the origins of these differences. Klein (1977) examined sex differences in reading achievement reported in studies from many nations. Klein concluded that the proposition that "culture is the main cause of sex differences in reading is inadequately supported by the findings." Findings reported in this study which demonstrated significant sex differences among whites but not among blacks apparently provides no further insight concerning the role of culture relative to sex differences. The only sound conclusion relative to sex differences appears to be that they do indeed exist for some groups while not for others.

Suggested areas of further research:

1. Examination of sex role identification among black boys and girls appears to be an important area for further study. Comparison of sex role perception of blacks and whites could provide valuable data relative to performance on measures of language competence. For example, did black boys who achieved mean scores equivalent to those of black girls have

different sex role perceptions from white boys?

2. Replication of this study with appropriate modifications on a longitudinal scale is advised for the purpose of determining the disposition of relative mean scores as children progress through schools. Comparative data from different environments could provide valuable insights.
3. It is advised that further research be conducted which examines the effects of instructional programs designed to encourage paradigmatic language development. Before such research is undertaken with young children, however, it appears essential that an evaluation of the subjects' acquisition of basic concepts be obtained. A measure such as the *Boehm Test of Basic Concepts* (Boehm, 1969) appears appropriate for such purposes. In this way evidence would be obtained relative to making a determination as to whether deficiencies in paradigmatic language competence might result primarily from lack of verbal concept development. If training in concept acquisition yields favorable results and if there is still a deficiency in paradigmatic language competence, it would appear that instruction designed to encourage paradigmatic language could profitably be undertaken.
4. It is suggested that studies be undertaken which examine the relationship of language competence and the quality of verbal interaction relative to individuals as they live within society. In other words, do people who have higher verbal

skills as measured by tests such as those used in this study tend to interact more capably and more positively with other people? Do people with poorer verbal skills tend to have a difficult and frustrating experience when verbally interacting with people with higher verbal capabilities?

5. Studies undertaken to examine the relationships of language competence to 1) life satisfaction, 2) self concept, and 3) personal aspiration are encouraged. Further, examination of effects of language improvement programs in the above stated areas is advised in that it appears essential to determine whether educational intervention can significantly modify life style deficiencies caused, in part at least, by lack of language competence.

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